

MACHINE-INDEPENDENT ALIGNMENT SYSTEM AND METHOD

Related Applications

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The present application is related to commonly assigned co-pending U.S. Patent Application No. 09/855,486 entitled, "BACKSIDE ALIGNMENT SYSTEM AND METHOD", filed on May 14, 2001, now Pat. No. 6,525,805.

Field of the Invention

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The present invention relates to alignment systems in optical apparatus, and in particular relates to a system and method for characterizing machine alignment offsets for lithography systems to provide for job portability between the lithography systems.

Background of the Invention

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In the manufacturing micro-devices (e.g., integrated circuits, thin-film head and ink jet heads) the processing steps include exposing a substrate, such as a semiconductor wafer coated with photosensitive material, using a lithographic exposure system. This exposure requires aligning the substrate residing on a substrate (wafer) stage, to a reticle having a pattern of a particular device layer, and residing on a reticle stage. In this regard, the lithographic system includes an alignment system, such as that disclosed in U.S. Patent No. 5,621,813 (referred to hereinafter as "the '813 patent"), which patent is incorporated herein by reference. After alignment, the reticle is exposed to radiation to which the photosensitive coating is sensitive, to transfer the reticle pattern onto the wafer. This alignment and exposure can be performed on a variety of lithography systems such as step and repeat, projection, contact and proximity systems, for example. Typically, the first of such device layers is aligned to some marking on the wafer, for example, to a flat or notch, as is well known. Subsequent layers are then aligned relative to this first layer and/or to each other.

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Most exposure systems utilize some mechanical means of pre-aligning the wafer, so that the wafer is coarsely aligned to the reticle. The pre-alignment may be, for example, a mechanical means of locating a flat or notch on the wafer. Alternatively, optical sensors may determine the location of the flat, notch, or peripheral edge of the